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(54) **Headrest for motor-vehicle seats**

Kopfstütze für Kraftfahrzeugsitze

Appui-tête pour siège de véhicule automobile

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## Description

[0001] The present invention is related to headrests for motor-vehicle seats, comprising a yielding body incorporating a load-bearing framework, a pair of parallel support rods slidably coupled with said load-bearing framework and projecting outside of the yielding body, locking means adapted to engage corresponding positioning notches provided of the support rods to prevent relative displacement between said support rods and said load-bearing framework, and manually operable release means of said locking means.

[0002] In the known headrests of the above-referenced type the locking means and the release means, through which in use the height position of the headrest can be adjusted relative to a backrest of the motor-vehicle seat, are generally designed and arranged so as manual operation of these release means is often uncomfortable and inconvenient.

[0003] It is known, from the document DE 86 20 793U, a headrest wherein the locking means include a pair of locking arms adapted to engage the notches of the support rods, said arms being carried by a pair of separate sliders secured to a pair of opposite push-buttons, which must be operated simultaneously by two hands.

[0004] It is also known from the document US 3 563 602 another headrest provided with a pair of notched rods engageable by locking means. Therein, the rods and the locking means are housed in the back seat, the locking means including a single slider having a pair of apertures crossed by the two support rods. The slider is bodily movable by a single push-button located at one side of the back seat, and it is integral with a yielding element urging the slider to a locking position.

[0005] The object of the present invention is to overcome the above drawback in a simple, practical and functional way.

[0006] A further object of the present invention is to provide a headrest of the above-referenced type whose locking means and release means have a high degree of functional efficiency as well as of operative safety.

[0007] According to the invention these objects are achieved by a headrest for motor-vehicle seats, comprising a yielding body incorporating a load-bearing framework, a pair of parallel support rods slidably coupled with said load-bearing framework and projecting outside of the yielding body, a pair of locking arms adapted to engage corresponding positioning notches provided on said support rods to prevent relative displacement between said support rods and said load-bearing framework, said arms being controlled by a slider member movable in said load-bearing framework in a direction perpendicular to said support rods between an engaged position wherein said arms are engaged with said positioning notches and a disengaged position wherein said arms are disengaged from said positioning notches, resilient thrust means urging said sliding member towards the engaged position, and at least one push-button ar-

ranged at one side of said yielding body and manually operable from outside to displace said slider member from said engaged position to said disengaged position against the action of said resilient thrust means, characterized in that the notches of said support rods face a side of the headrest, said arms being parallel to each other and being arranged transversally of said support rods, the moving direction of said sliding member being also perpendicular to said arms, and said resilient thrust means comprise a pair of wire springs, each one having a first branch reacting said load-bearing framework and a second branch constituting a corresponding one of said locking arms.

[0008] Moreover the slider member is formed with a pair of integral resilient stop teeth adapted to snap engage beneath corresponding projections provided on said support rods to prevent full withdrawal of said support rods (4) relative to said load-bearing framework.

[0009] The notches of the support rods may face the same side of the headrest, said slider member being formed in a single piece and being operated by a single push button.

[0010] Alternately, the notches of one support rod may face one of the two sides of said yielding body, and the notches of the other support rod may face the other of the two sides, a pair of push buttons arranged at said two sides, said pair of push button being selectively manually operable from the outside and being each one adapted to move said slider member.

[0011] In this case, the slider member is formed by two mutually displaceable distinct portions, each of which is connected to a respective push-button, and the slider portions are connected to each other by a reversing mechanism, whereby a displacement of one slider portion in one direction, operated through the related push-button, corresponds to a same displacement of the other slider portion in the opposite direction.

[0012] This solution affords the advantage to make the headrest according to the invention indifferently utilizable for both right and left motor-vehicle seats.

[0013] The invention will now be disclosed in detail with reference to the accompanying drawings, purely provided by way of non limiting example, in which:

- Figure 1 is a diagrammatic and partially vertically sectioned view of a headrest for motor-vehicle seats according to the invention,
- Figure 2 is a horizontally sectioned view along line II-II of figure 1,
- Figure 3 is a vertically sectioned view along line III-III of figure 1,
- Figure 4 is a vertically sectioned view along line IV-IV of figure 1, and
- Figure 5 shows a variant of figure 2.

[0014] Referring initially to figures 1 through 5, reference numeral 1 generally designates a headrest for motor-vehicles, essentially formed by a yielding body or

cushion 2, normally made of foamed plastic material, incorporating a load-bearing framework 3 normally made of rigid moulded plastic material, and a pair of support rods 4 parallel to each other and slidably coupled with the load-bearing framework 3. This coupling enables, in use, adjustment of the height positioning of the cushion 2 relative to the top of the backrest of a motor-vehicle seat on which the headrest 1 is installed.

[0015] The rods 4 may be fully metallic or, as in the case of the shown example and in a way known per se, they may comprise a metal core 5 over the upper portion of which a rigid plastic material lining 6 is moulded. In any case, each support rod 4 is provided along one side with a vertical series of positioning notches 7 having preferably a quadrangular cross-section. In the case of the embodiment depicted in figures 1 through 4, the notches 7 of the two support rods 4 are both facing towards the same side of the headrest, i.e. to the right with reference to figures 1 and 2.

[0016] The support rods 4 are lowerly projecting beneath the yielding body 2 for their connection, in a conventional way, to the bearing structure of the backrest of a motor-vehicle seat. Naturally the rods 4 may be provided, also in a way known per se, with respective articulated joints to enable adjustment of the inclination of the yielding body 2.

[0017] The load-bearing framework 3 is formed, in one piece, with a pair of tubular portions 8 slidably receiving therein the support rods 4, and also with a horizontal housing 9 terminating at one end, i.e. that facing towards the left side 1a of the headrest 1 with reference to figures 1 and 2, with an integral tubular guide appendage 10 which in turn is fitted through a lateral passage 11 of the yielding body 2.

[0018] Within the horizontal housing 9 a slider member 12 is arranged, which is formed by one piece of moulded plastic material and is movable perpendicularly to the support rods 4, in the way which shall be clarified herebelow.

[0019] Reference numerals 13 designate two metal wire or clip V-shaped springs each of which has a springing arm 14 reacting against a corresponding reaction surface 16 of the housing 9 of the load-bearing framework 3, and an arm 15 which is rigidly secured into the slider member 12, with a central portion of the arm 15 being exposed such as depicted in figure 2.

[0020] The above exposed central portions of the arms 15 are normally extending through the tubular portions 8 of the load-bearing framework 3, and are adapted to engage the notches 7 of the two support rods 4 such as clarified in the following.

[0021] The springing branches 14 of the two wire springs 13 act as resilient thrust members urging the slider member 12 into the engaged position shown in the drawings, in which same is displaced to the left with reference to figures 1 and 2 in such a way that the arms 15 engage corresponding notches 7 of the support rods 4, thus preventing relative sliding between the load-

bearing framework 3 with the yielding body 2 and the support rods 4 of the headrest 1.

[0022] Reference numeral 17 designates a control member formed as a manually operable push-button arranged at one side 1a of the headrest 1 and rigidly connected to a stem 18, which in turn is axially slidable along the tubular appendage 10 of the housing 9 and is rigidly secured at 19 to the slider member 12.

[0023] The control push-button 17 can be operated from outside to displace the slider member 12 from the engaged position shown in the drawings towards a disengaged position in which same is moved to the right with reference to figures 1 and 2, against the action of the springing branches 14 of the wire springs 13. Owing to this displacement the locking arms 15 are withdrawn from the notches 7 of the support rods 4, whereby in use the yielding body 2 can be moved upwardly or downwardly, by virtue of sliding of the tubular portions 8 of the load-bearing framework 3 along the support rods 4, to perform height adjustment relative to the backrest of a motor-vehicle seat. Upon release of the control push-button 17, the springing branches 14 of the wire springs 13 move the slider member 12 back to its initial position in which the arms 15 shall engage corresponding positioning notches 7 of the support rods 4.

[0024] It will be apparent from the foregoing that locking and unlocking operation between the yielding body 2 and the support rods 4, and accordingly height adjustment operation of the yielding body 2, are made extremely easy and convenient. Moreover, due to the fact that the wire springs 13 simultaneously act both as locking members (through the respective arms 15) and as resilient thrust members (through the respective springing branches 14), the construction of the locking and release mechanism of the headrest according to the invention is made particularly simple and economical, but at the same time sturdy.

[0025] Reference numerals 22 designate two resilient stop teeth integrally formed with the slider member 12 and whose function is to prevent full withdrawal of the support rods 4 relative to the load-bearing framework 3. Upon mounting of the support rods 4 into the tubular portions 8 of the load-bearing framework 3, the resilient teeth 22 snap engage beneath corresponding upper projections 23 (figure 3) of the support rods 4. Following assembling, in the fully raised condition of the yielding body 2 along the support rods 4, the stop teeth 22 abut against the projections 23.

[0026] Figure 5 shows an alternative embodiment of the invention in which, instead of one single control push-button 17, two control push-buttons 17a, 17b are provided, which are arranged at the opposite sides 1a, 1b of the headrest 1. This arrangement may be more convenient than that previously disclosed with reference to figures 1 through 4, since it enables employing the headrest according to the invention indifferently for both right and left motor-vehicle seats, making available in either case a control push-button (each time the push-

button 17a or the push-button 17b) facing towards the outer side of the vehicle for a more easy and convenient operation thereof by the user.

[0027] In this variant the slider member 12, instead of being formed by one single piece, is comprised of two distinct portions 12a, 12b, each of which is connected at 19a, 19b to the respective push-button 17a, 17b. In correspondence of the respective inner ends 20a, 20b the two slider portions 12a, 12b are connected to each other by a reversing mechanism 21, through which displacement of one slider portion 12a, 12b in one direction, operated by means of the respective control push-button 17a, 17b, corresponds to a same displacement of the other slider portion 12b, 12a in the opposite direction. The reversing mechanism 21 can be constituted, as in the case of the illustrated example, by a dual-fit rocker element swingably supported within the housing 9 of the load-bearing framework 3, or by any other functionally equivalent mechanism (for instance a rack-and-pinion system or the like).

[0028] The arrangement and the function of the two wire springs 13 are same as those of the embodiment previously disclosed, with the only difference related to the fact that their location is specularly opposite: namely, since in this case the positioning notches 7 of the two support rods 4 are juxtaposed to one another, the locking arms 15 are facing towards the sides 1a, 1b of the headrest 1, respectively, while the springing branches 14 are facing inwardly.

[0029] Moreover each slider portion 12a, 12b is formed with a respective tubular appendage 10a, 10b for the stem 18a, 18b of the respective control push-button 17a, 17b.

[0030] Naturally the details of construction and the embodiments may be widely varied with respect to what has been disclosed and illustrated, without thereby departing from the scope of the present invention, such as defined in the appended claims.

#### Claims

1. A headrest (1) for motor-vehicle seats, comprising a yielding body (2) incorporating a load-bearing framework (3), a pair of parallel support rods (4) slidably coupled with said load-bearing framework (3) and projecting outside of the yielding body (2), a pair of locking arms (15) adapted to engage corresponding positioning notches (7) provided on said support rods (4) to prevent relative displacement between said support rods (4) and said load-bearing framework (3), said arms (15) being controlled by a slider member (12) movable in said load-bearing framework (3) in a direction perpendicular to said support rods (4) between an engaged position wherein said arms (15) are engaged with said positioning notches (7) and a disengaged position wherein said arms (15) are disengaged from said positioning notches (7), resilient thrust means (14) urging said sliding member (12) towards the engaged position, and at least one push-button (17) arranged at one side (1a) of said yielding body (2) and manually operable from outside to displace said slider member (12) from said engaged position to said disengaged position against the action of said resilient thrust means (13), **characterized in that:**
  - the notches (7) of said support rods (4) face a side of the headrest (1), said arms (15) being parallel to each other and being arranged transversally of said support rods (4), the moving direction of said sliding member (13) being also perpendicular to said arms (15), and said resilient thrust means comprise a pair of wire springs (13), each one having a first branch (14) reacting said load-bearing framework (3) and a second branch (15) constituting a corresponding one of said locking arms.
2. A headrest according to claim 1, **characterized in that** each one of said branch (15) is rigidly secured into said slider member (12) so as to present a central portion of said branch (15) exposed to engage said notches (7).
3. A headrest according to claim 1 or 2, **characterized in that** said load-bearing framework (3) has an integral housing (9) for said slider member (12) and at least one lateral integral tubular guide appendage (10) for said at least one push button (17).
4. A headrest according to any precedent claim, **characterized in that** said slider member (12) is formed with a pair of integral resilient stop teeth (22) adapted to snap engage beneath corresponding projections (23) provided on said support rods (4) to prevent full withdrawal of said support rods (4) relative to said load-bearing framework (3).
5. A headrest according to any precedent claim, **characterized in that** the notches (7) of said support rods (4) face the same side (1a) of the headrest (1), said slider member (12) being formed in a single piece and being operated by a single push button (17).
6. A headrest according to any claim from 1 to 4, **characterized in that** the notches (7) of one of said support rods (4) face one of the two sides (1a, 1b) of said yielding body (2), and the notches (7) of the other of said support rods (4) face the other of said two sides (1a, 1b) a pair of push buttons (17a, 17b) being arranged at said two sides (1a, 1b), said pair of push buttons (17a, 17b) being selectively manually operable from the outside and being each one

adapted to move said slider member (12).

7. A headrest according to claim 6, **characterized in that** said slider member (12) is formed by two mutually displaceable distinct portions (12a, 12b), each of which is connected to a respective push-button (17a, 17b), and **in that** said slider portions (12a, 12b) are connected to each other by a reversing mechanism (21), whereby a displacement of one slider portion (12a, 12b) in one direction, operated through the respective push-button (17a, 17b), corresponds to an equal displacement of the other slider portion (12b) in the opposite direction.

#### Patentansprüche

1. Kopfstütze (1) für Kraftfahrzeugsitze umfassend einen nachgiebigen Körper (2), der einen lastaufnehmenden Rahmen (3), ein Paar parallele Stützstangen (4), die gleitbar mit dem lastaufnehmenden Rahmen (3) gekoppelt sind und aus dem nachgiebigen Körper (2) nach außen vorstehen, ein Paar von Verriegelungsarmen (15), die geeignet sind, an entsprechenden Positionierungskerben (17) anzugreifen, die auf den Stützstangen (4) vorgesehen sind, um eine relative Lageänderung zwischen den Stützstangen (4) und dem lastaufnehmenden Rahmen (3) zu verhindern, wobei die Arme (15) durch ein Gleitstück (12) gesteuert werden, das in dem lastaufnehmenden Rahmen (3) in einer Richtung senkrecht zu den Stützstangen (4) zwischen einer Eingriffsposition, wo die Arme (15) an den Positionierungskerben (7) angreifen, und einer Freigabeposition, in der die Arme (15) außer Eingriff von den Positionierungskerben (7) sind, bewegbar ist, nachgiebige Druckmittel (14), die das Gleitstück (12) in die Eingriffsposition drücken, und wenigstens einen Druckknopf (17), der auf einer Seite (1a) des nachgiebigen Körpers (2) angeordnet ist und von außen von Hand betätigbar ist, um den Gleitkörper (12) von der eingerückten Position in die Freigabeposition gegen die Wirkung der nachgiebigen Druckmittel (13) verschieben, **dadurch gekennzeichnet, dass:**

die Kerben (7) der Stützstangen (4) zu einer Seite der Kopfstütze (1) hin gerichtet sind, wobei die Arme (15) parallel zueinander und transversal zu den Stützstangen (4) angeordnet sind, und wobei die Bewegungsrichtung des Gleitstücks (12) ebenfalls senkrecht zu den Armen (15) ist, und dass

die nachgiebige Druckeinrichtung ein Paar von Drahtfedern (13) aufweist, die jeweils einen ersten Arm (14), der mit dem lastaufnehmenden Rahmen (3) zusammenwirkt, und einen zweiten Arm (15) aufweisen, der einen entspre-

chenden der Verriegelungsarme bildet.

2. Kopfstütze nach Anspruch 1, **dadurch gekennzeichnet, dass** jeder der Arme (15) starr in dem Gleitstück (12) befestigt ist, um einen zentralen Abschnitt des Armes (15) frei zu legen, um an den Kerben (7) anzugreifen.
3. Kopfstütze nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der lastaufnehmende Rahmen (3) ein einstückiges Gehäuse (9) für das Gleitstück (12) und wenigstens einen seitlichen, einstückigen, rohrförmigen Führungsansatz (10) für den wenigstens ein Druckknopf (17) hat.
4. Kopfstütze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gleitstück (12) mit einem Paar von einstückigen, nachgiebigen Stoppzähnen (22) ausgebildet ist, die geeignet sind, unter entsprechende Vorsprünge (23) einzuschnappen, die auf den Stützstangen (4) vorgesehen sind, um ein vollständiges Abziehen der Stützstangen (4) relativ zu dem lastaufnehmenden Rahmen (3) zu verhindern.
5. Kopfstütze nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Kerben (7) der Stützstangen (4) zu der gleichen Seite (1a) der Kopfstütze (1) hin gerichtet sind, wobei das Gleitstück (12) in einem einzigen Stück ausgebildet ist und durch einen einzigen Druckknopf (17) betätigt wird.
6. Kopfstütze nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Kerben (7) von einer der Stützstangen (4) zu einer der beiden Seiten (1a, 1b) des nachgiebigen Körpers (2) hin gerichtet sind, und dass die Kerben (7) der anderen der Stützstangen (4) zu der anderen Seite der beiden Seiten (1a, 1b) hin gerichtet sind, dass ein Paar von Druckknöpfen (17a, 17b) an den zwei Seiten (1a, 1b) angeordnet sind, wobei das Paar der Druckknöpfe (17a, 17b) wahlweise von Hand von außen her betätigbar sind und jeweils einzeln in der Lage sind das Gleitstück (12) zu bewegen.
7. Kopfstütze nach Anspruch 6, **dadurch gekennzeichnet, dass** das Gleitstück (12) durch zwei wechselweise verschiebbare, separate Abschnitte (12a, 12b) gebildet ist, von denen jeder mit einem entsprechenden Druckknopf (17a, 17b) verbunden ist, und dass die Gleiterabschnitte (12a, 12b) durch einen Umkehrmechanismus (21) miteinander verbunden sind, wodurch eine Verschiebung von einem Gleiterabschnitt (12a, 12b) in einer Richtung unter der Betätigung durch den entsprechenden Druckknopf (17a, 17b) einer gleich großen Verschiebung des anderen Gleiterabschnittes (12b) in

der entgegengesetzten Richtung entspricht.

## Revendications

1. Appui-tête (1) pour sièges de véhicules automobiles, comprenant un corps souple (2) dans lequel une ossature porteuse (3) est incorporée, une paire de tiges de support parallèles (4) réunies, avec une liberté de coulissement, à ladite ossature porteuse (3) et faisant saillie à l'extérieur du corps souple (2), une paire de bras de verrouillage (15) aptes à venir en prise dans des encoches de positionnement correspondantes (7), prévues sur lesdites tiges de support (4), afin d'empêcher un déplacement relatif entre lesdites tiges de support (4) et ladite ossature porteuse (3), lesdits bras (15) étant manoeuvrés par un organe coulissant (12) déplaçable dans ladite ossature porteuse (3), dans une direction perpendiculaire auxdites tiges de support (4), entre une position d'engagement, dans laquelle lesdits bras (15) sont placés en prise avec lesdites encoches de positionnement (7), et une position de désengagement dans laquelle lesdits bras (15) sont dégagés desdites encoches de positionnement (7), des moyens de poussée élastiques (14) sollicitant ledit organe coulissant (12) vers la position d'engagement, et au moins un bouton-poussoir (17) disposé sur une face latérale (1a) dudit corps souple (2) et pouvant être actionné de l'extérieur, à la main, afin de faire passer ledit organe coulissant (12) de ladite position d'engagement à ladite position de désengagement à l'encontre de l'action desdits moyens de poussée élastiques (13), **caractérisé en ce que:**

les encoches (7) desdites tiges de support (4) sont tournées vers une face latérale de l'appui-tête (1), lesdits bras (15) étant parallèles l'un à l'autre et étant disposés transversalement auxdites tiges de support (4), la direction de déplacement dudit organe coulissant (12) étant également perpendiculaire auxdits bras (15), et lesdits moyens de poussée élastiques comprennent une paire de ressorts à branches (13) en fil métallique, chacun d'eux comportant une première branche (14) placée en contre-appui sur ladite ossature porteuse (3) et une seconde branche (15) qui constitue un bras de verrouillage correspondant de ladite paire de bras de verrouillage.

2. Appui-tête selon la revendication 1, **caractérisé en ce que** chacune desdites branches (15) est rigidement fixée à l'intérieur dudit organe coulissant (12) de telle façon qu'une partie centrale de ladite branche (15) soit mise à nu pour venir en prise avec lesdites encoches (7).

3. Appui-tête selon la revendication 1 ou 2, **caractérisé en ce que** ladite ossature porteuse (3) comporte un logement (9), formé d'un seul tenant avec elle, pour ledit organe coulissant (12) et au moins un appendice de guidage tubulaire latéral (10) formé d'un seul tenant avec elle, pour ledit au moins un bouton-poussoir (17).
4. Appui-tête selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit organe coulissant (12) est doté d'une paire de dents d'arrêt élastiques (22), formées d'un seul tenant avec lui, qui sont aptes à s'encliqueter sous des saillies correspondantes (23) prévues sur lesdites tiges de support (4), afin d'empêcher un retrait complet desdites tiges de support (4) par rapport à ladite ossature porteuse (3).
5. Appui-tête selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les encoches (7) desdites tiges de support (4) sont tournées vers la même face latérale (1a) de l'appui-tête (1), ledit organe coulissant (12) étant réalisé sous forme d'une pièce unique et étant actionné par un bouton-poussoir unique (17).
6. Appui-tête selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** les encoches (7) de l'une desdites tiges de support (4) sont tournées vers l'une des deux faces latérales (1a, 1b) dudit corps souple (2), et les encoches (7) de l'autre desdites tiges de support (4) sont tournées vers l'autre desdites deux faces latérales (1a, 1b), deux boutons-poussoirs (17a, 17b) étant disposés sur lesdites deux faces latérales (1a, 1b), lesdits deux boutons-poussoirs (17a, 17b) pouvant être actionnés sélectivement, à la main, de l'extérieur et étant chacun apte à déplacer ledit organe coulissant (12).
7. Appui-tête selon la revendication 6, **caractérisé en ce que** ledit organe coulissant (12) est formé par deux parties séparées (12a, 12b) qui peuvent être déplacées l'une par rapport à l'autre et dont chacune est reliée à un bouton-poussoir respectif (17a, 17b), et **en ce que** lesdites parties d'organe coulissant (12a, 12b) sont reliées l'une à l'autre par un mécanisme inverseur (21), au moyen duquel un déplacement dans une direction d'une partie d'organe coulissant (12a, 12b), actionnée par l'intermédiaire du bouton-poussoir respectif (17a, 17b), correspond à un déplacement de longueur égale de l'autre partie d'organe coulissant (12b) dans la direction opposée.

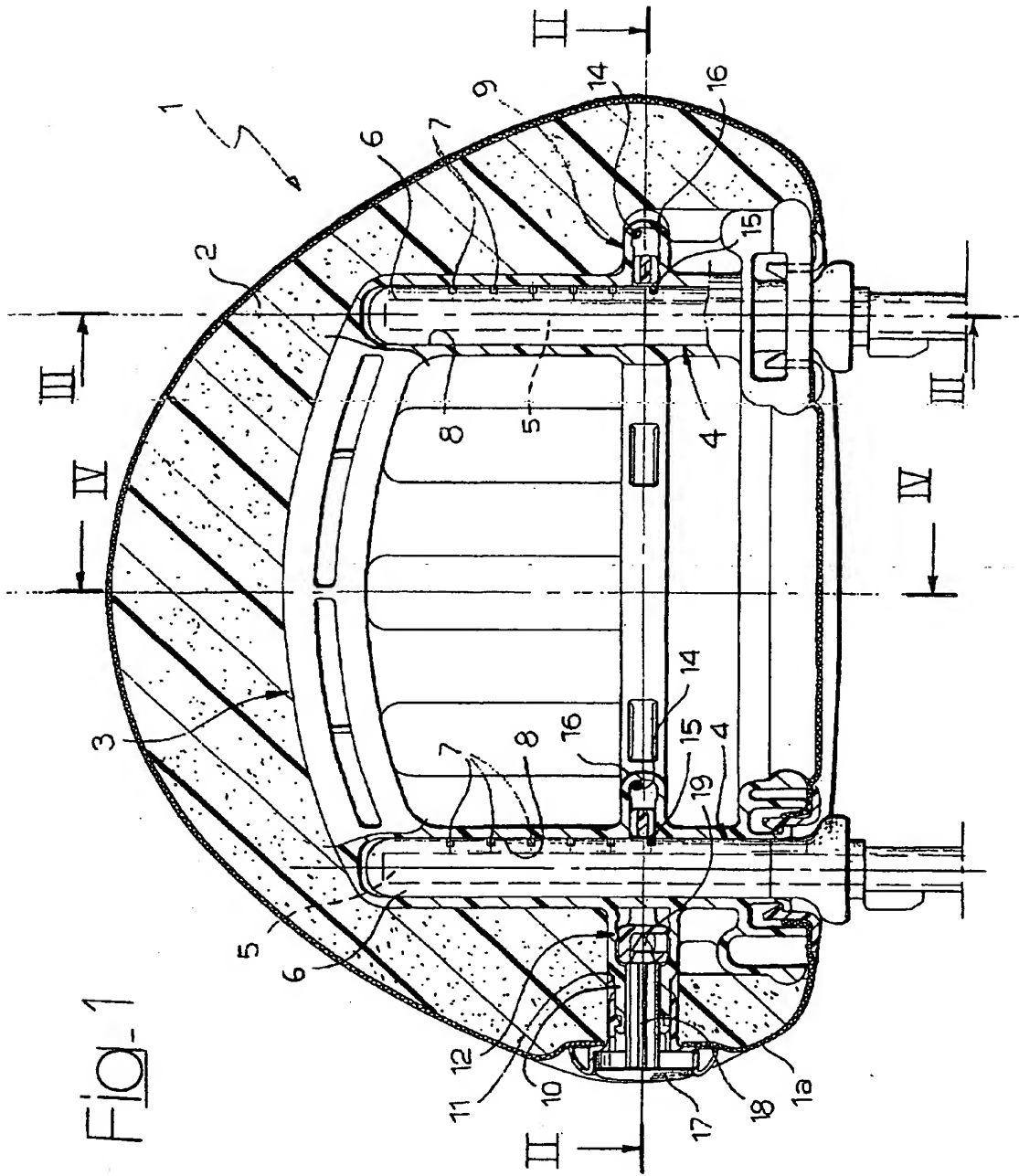


Fig. 2

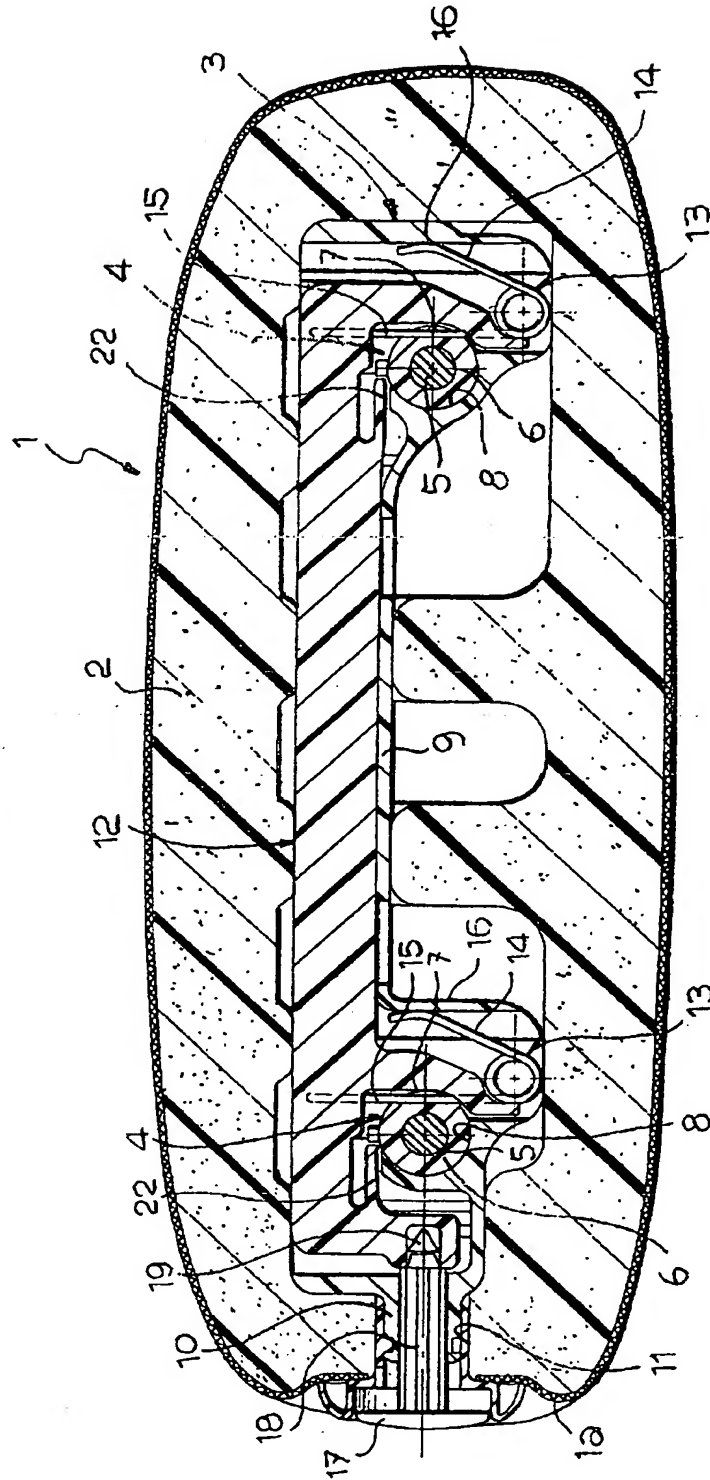




Fig. 3

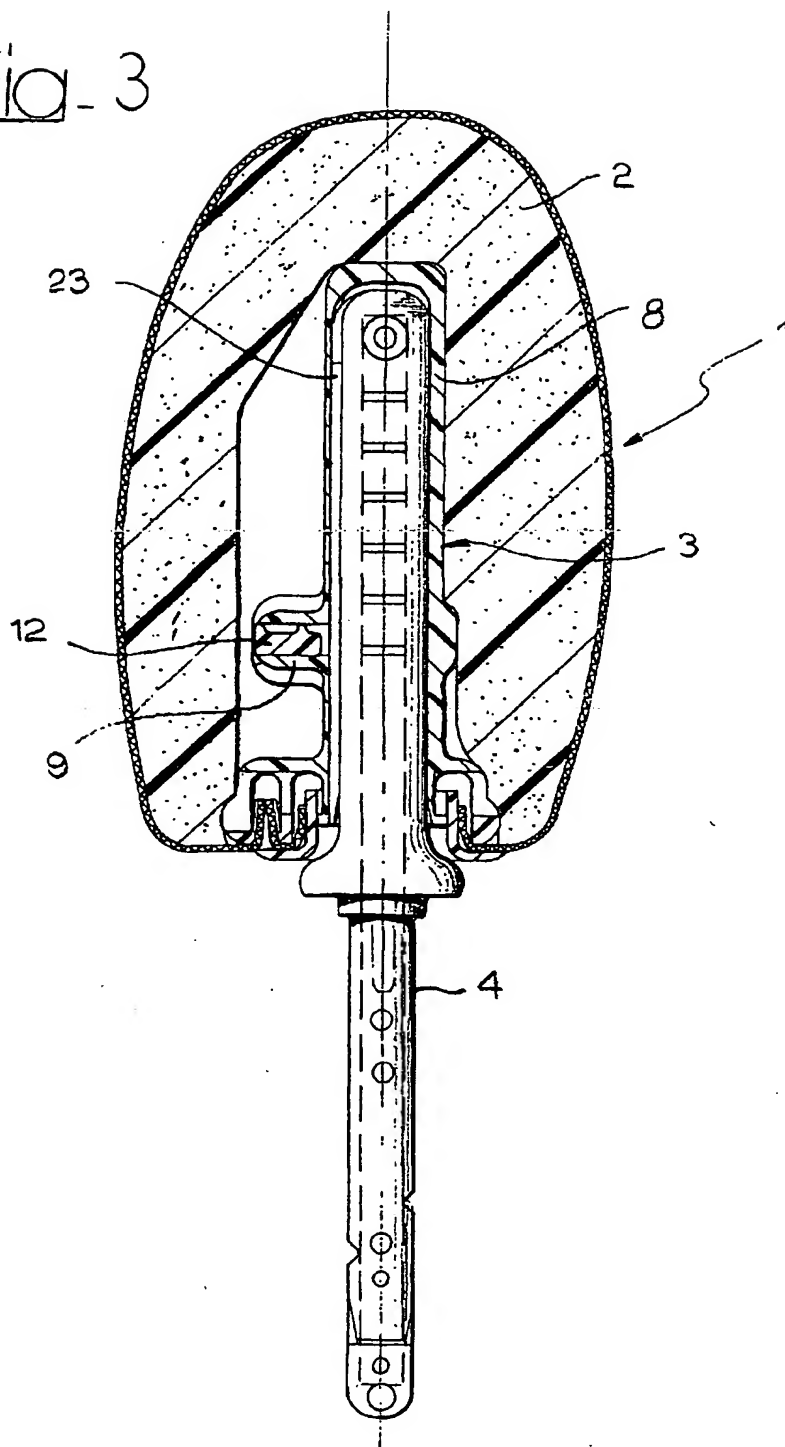


Fig. 4

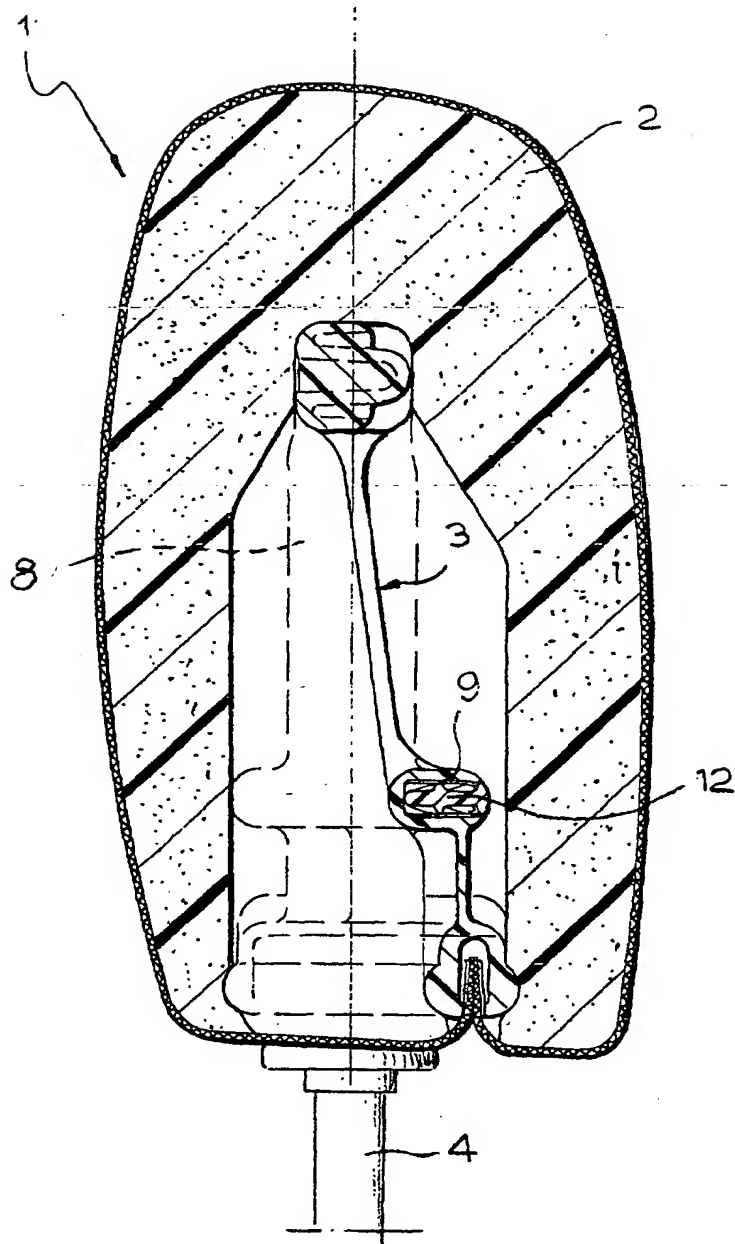


Fig. 5

